SOUTHERN SWAMPS

THE NATURE CONSERVANCY NEWS

SUMMER 1977

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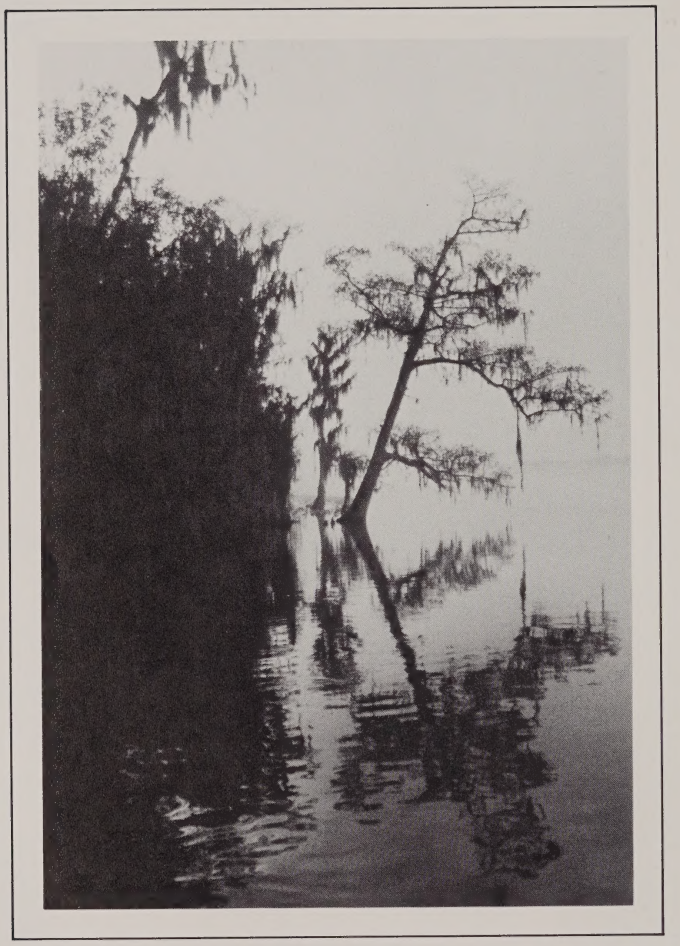

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THE NATURE CONSERVANCY NEWS

Published Quarterly by The Nature Conservancy
1800 North Kent Street, Arlington, Virginia 22209
Sue E. Dodge, Editor
Anne M. Byers, Copy Editor

Volume 27, Number 3 **Summer, 1977**

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COVER PHOTO: Cypress trees in Four Hole Swamp, South Carolina, by Susan Bournique.

INSIDE COVER PHOTO: Cypress draped with Spanish moss, Suwannee River, Florida, by Tim Loomis.

LAND CONSERVATION THROUGH PRIVATE ACTION

The Nature Conservancy is a national conservation organization, receiving its support from the public, whose objective is to preserve and protect ecologically and environmentally significant land and the diversity of life it supports.

To achieve this goal, the Conservancy purchases lands using its revolving fund which is then replenished through fund raising; accepts gifts of land; retains and provides stewardship for 60% of all projects; works with local, state, and federal governments to identify and protect important natural areas and acquires and manages land in advance of government agencies' ability to do so.

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Why Save Swamps?

by Dr. Charles H. Wharton
Professor of Biology
Georgia State University

Twelve thousand years ago, great shaggy mammoths and mastodons moved in the swamps of many of our southern rivers. Perhaps these huge beasts were drawn there by the lush vegetation, or driven there by a ring of fire surging through the pine and scrub oak lands, to be mired and killed by the ancient hunters. All we know for sure is that they were there, for their algae-covered bones yet carpet the bottoms of many spring-fed rivers, where, if you can brave the cold water, you can dive and bring them up, for the spring runs carried no sand or silt to cover them. Drawn there by the water and the last of the great faunal assemblage of the Pleistocene, the South's first men encountered a wetland—the river swamp—that would in the future both nourish and mystify them.

As sea levels rose, great cypress forests invaded the flood plains of our rivers. Two hundred years ago, William Bartram said, "We are struck with a kind of awe . . . the trees so lofty . . . having flat tops, and all of equal height, seemed to be a green plain, lifted up and supported upon columns in the air . . ." Deep in the river swamps of the Suwannee and St. Johns in Florida, Bartram was overwhelmed with the diversity and abundance of life. Flocks of "Spanish curlew" wheeled overhead, green clouds of parakeets chattered as they devoured the cypress seeds, and the toy-trumpet call of the ivory-billed woodpecker resounded through the bottomlands of sweet gum and overcup oak. In a camp on a St. Johns bluff, amid the bellowing of alligators and the splashing of huge schools of migrating fish, Bartram pondered the legions of red men who had camped there before him to feast on the mussels, fish, reptiles, and fowl that filled one of nature's richest larders.

A hundred years later, a Hart Line steamer, cruising by night, carried Sidney Lanier up the dark current of the Oklawaha River through one of Florida's most magnificent river swamps. The forest walls on either side were illuminated by fat-wood fires in iron baskets slung from the forecastle. Inspired, Lanier called it "the sweetest water-lane in the world . . . as if God had turned into water and trees."

While the tortured cry of the panther may still be heard in a few last redoubts of wild swampland, the parakeets and ivorybills have vanished from the river swamps. An enduring stump here and there, flanked by a regrowth of ash and gum, are all that remain of the cathedral forest that awed William Bartram.

Quite oddly, it seems to me, the great swamps, and the floodplains that give our rivers life, have been strangely ignored in the descriptive literature of the past 200 years.

Yet these rivers and their protective swamps were the very lifeblood of the early South; watery roads that carried the essentials of life to settlers upstream and then floated out the wealth of America: logs from the seemingly endless forest of virgin longleaf pine, and produce from the fields of cotton and corn. Successive eras of poleboating, log-rafting, and steamboating—real sagas of Americana—went unheralded in the history books.

And yet, the river swamps remain one of the richest, most exciting, and most natural systems of all our southern environments. They come in three types, basically: alkaline, clear water, from underground rivers; red water, clay-rich and muddy, from the uplands of Alabama and Georgia; and

acid, black water, heavy with organic compounds steeped from leaves and twigs in endless back swamps and feeder streams.

The river swamps are productive for both man and wildlife. Veneer factories feed from the gum logs. Otters and raccoons feast on the abundant crayfish, and little piles of empty shells tell of the presence of the limpkin, or "crying bird," which garners the rich snail crop. Countless other birds and squirrels eat the fruits of black gum, tupelo, and ogeechee lime; and tupelo honey attests the treasure store of nectar in the forest flowers. The huge acorn crop feeds the deer, the raccoons, and the black and mallard ducks which winter by thousands in river swamps.

The floodplain floor, with its cycle of alternating wetness and dryness, is the remarkable machinery that drives great pulses of life. Fish, their breeding cycles timed to the first high water that escapes the channel, spread out over the floodplain and feed among the roots of oaks and hickories. Fattened and spent of eggs, they congregate back into sloughs and channels where the fisherman reaps a rich harvest.

In the larger red rivers each spring, striped bass, sturgeon, and three species of shad surge upstream, choosing select sections of the river in which to spawn, and their fry use yet other sections as nurseries. And the debris, coupled with the silt brought in with high water, always supports an incredible abundance of aquatic life—insect larvae and crayfish—that feeds the river fauna with a steady supply of drifting food. Indeed, the high productivity of crabs, shrimp, and oysters of some coastal estuaries and bays depends, in large part, on the delivery of nutrients by our large river systems.

Though rich in iron and alumina from ground water, black water streams subsist largely on their own organic debris, flushing their swamps regularly of organically rich acid water. In the alluvial red water streams, the river and the floodplain trees team up in a partnership. Billions of tiny rootlets and their fungal extensions clutch the precious sediment to prevent its downstream movement, receiving as a reward a gentle blanket of nutritious silt at the time of high water. Vital to both systems is the annual rise and fall of water that inundates the floodplain and then flows off again, for the chemistry of the water and fallen leaves is inexorably linked to this eons-old fluctuation. And because of this unique cyclic intimacy between river and floodplain, between high ground and low, man benefits and has benefited for many years.

It was the Apalachee Indians who first denuded the red hills where Tallahassee, Florida, stands.

Their corn helped feed the Spanish missions as far away as St. Augustine. Later, the cotton farmers on the hills of Alabama and Georgia sent 50,000 years of topsoil into the river swamps. But the swamps survived man's upland indiscretions, for they were adapted to catastrophy, and man was simply augmenting their natural function. It was our first indication that the river swamps could do things for us that we might well treasure as life support functions. And so we are led, in these energy-poor times, to take a closer look at the free energy of this natural system.

Not only do the swamps serve as giant sponges to hold water back from gravity's eternal pull, but they may be vital filters to clean our rivers of the wastes of an industrial and urbanized world. It has been shown that a relatively few hundred acres of river and floodplain can purify the wastes of a town of respectable size. With the rising costs of tertiary treatment, such potential cannot be ignored.

I once asked a farmer where an obviously polluted creek went. "Oh," he said, "just into that ol' swamp down there." Science is now taking note of those "ol' swamps." It is likely that river swamps have been saving southern communities millions of dollars by treating their secondary and tertiary wastes. Tons of toxic nitrates and pesticides from farmlands, poisonous heavy metals from industry, and even, in some cases, radioactive wastes, all have been processed by the river swamps, either

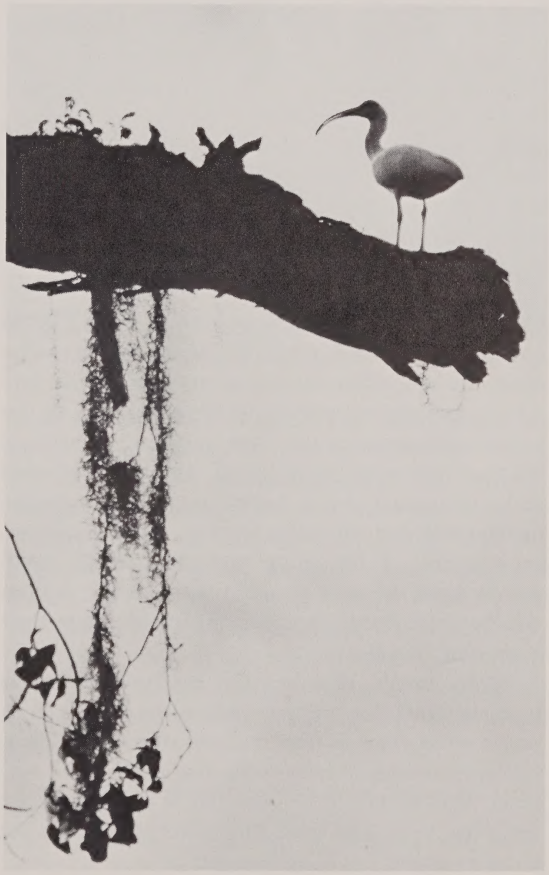
Left, a raccoon pauses on a fallen log; above, trees reflect in the waters of Four Hole, a black water cypress swamp; right, a white ibis perches in Corkscrew Swamp, Florida.

bound to sediments and deposited out on the floodplains to be broken down or immobilized, or locked into harmless form by organic molecules and carried downriver into the estuary.

Such abilities have inspired an intensive study by the University of Florida's Center for Wetlands to examine the potential of other swamps, such as cypress ponds, which are acting as inexpensive waste disposal units and, at the same time, growing trees faster.

Another little-known relationship concerns the fact that black water surface streams are inseparably linked to the dark caverns of underground rivers on which coastal zones depend for their water. Full with black, acid water in rainy periods, these streams pour underground to recharge the vital aquifer. In dry times, the role is switched, and the aquifers repay the debt and keep the rivers flowing.

As we attempt now to power-down society to some stable survival level, recognition of their life support role must go to natural systems. But how far can we push them? Perhaps there is a point at which we can overload the machinery of the river swamps.



In the past, moving water was supposed to carry the refuse of civilization, like a beer or bait can thrown off a river bridge, away from our life and memory. While the swamps are now devoid of the greatest trees ever grown in eastern America, and have often reeled with sweeping pulses of toxic wastes and eroded soil, they are still viable, productive systems. Can we keep it that way? Are there other threats? Yes, but we shall have to act, acknowledge natural function, verify its limits with science, and then protect it. Unhappily, there are sweeping changes possible that threaten these vital natural systems, mostly brought about by the combined power of large industry and government. These are not malicious attempts to destroy the shad fishery, or the acorn crop that feeds the deer, or the machinery that keeps the water flowing and pure. It is just that we are slow in recognizing the value of our river swamps. The next time your car hurtles along a river swamp bridge, reflect for a moment on the realm of muck and moss below. It has much to tell us about our past —and our future.

It is impressive to fly over the southern coastal plain. Through the endless tree farms of pine, the river swamps run like green corridors of life. They are the final refuges for deer, bear, and raccoon, where man and dog must pause. They are also the pathways of migration. Where raccoons were exterminated by rabies or the fur coat craze of the twenties, they could move northward up the river corridors and again populate their wetland heritage. Clams, destroyed by a toxic pulse of industrial chemistry, are repopulated by the drifting larvae from upstream.

But all is not well in our river greenbelts. Having known only an occasional opening in the dense green canopy, from a storm blow-down, bottomland hardwood forests are beginning to be completely denuded in patches of many acres. The clear cut, a sensible means of managing pine forests, is now being applied by large industry to the hardwood forests of the river swamps. Sometimes the trees are even wind-rowed, and pines planted and maintained, by a heavy input of expensive mechanical and chemical energy, against the encroachment of the more wetland-adapted hardwoods such as sweet gum. In some areas, cottonwoods and sycamores are being planted for their high yield of pulp.

Barge canals that provide tax-supported free transportation for shippers can quiet clearly turn entire river swamps into shallow, over-rich biological nightmares. Heavy with roe, the shad, sturgeon, and striped bass visit the lower most dam for a few years and then, their life span exhausted, come no more.

To encourage a few more pines, canals and vast channelization projects attempt to lower the water table along the upland tributaries that formerly hosted migrant fish which found in them a spawning and nursery ground safe from the predation in the large river. Bottomland hardwoods, deprived of a high water table, lessen their growth rate or succumb to disease.

Sometimes man, not understanding that river swamps must be allowed to rise and flood each year, attempts to improve on nature. This happened on the Chipola in Florida, where a series of highly productive old oxbows were impounded in the early 1960's. The unnaturally high water killed many trees, and the lack of natural drawdown and the disruption of yearly flushing led to a serious water weed and eutrophication problem that was finally solved by new construction, at taxpayers' expense, that will imitate nature's original plan.

That water must get off a floodplain as easily as it got on has not been long recognized; nor, apparently, has the fact that landfills across flooded plains cause excessive silt deposition and flooding upstream. A ride down almost any southern highway will verify this. On one side is a healthy forest; on the other side, the spindly, sick, and dying trees tell their own story. To preserve a viable floodplain community, one crosses a floodplain on cement columns which do not interfere with the water flow.

As if the modification to the floodplains imposed by large industry and government construction were not enough, we must also acknowledge the threat of development. Rows of second homes on bluffs, and houseboats anchored indiscriminately, may deprive the public of access points to the rivers, as well as blight the most scenic and historical places. Almost every river bluff along the larger streams was an Indian encampment or village, or mission, or trading post.

Man does not, of course, remember the mastodons and ground sloths. I doubt that he will mourn the passing of the swamp-loving Bachman's warbler, or the loss of the parakeet and the ivory-bill. His spirit will be a little less, however, if the swallow-tailed kite, the limpkin, and the great sturgeon pass from memory. There are modifications of the river swamp, however, that, I think, will impoverish his life very much. These are life support things that would affect the quantity and quality of his water supply.

And then there are less tangible—but no less vital—uses of the river swamps, as outdoor laboratories for school systems, and as extremely valuable river parks and scenic rivers for recreation. I see each year new fleets of canoes bringing the

River swamps are not only ecologically important, but also valuable as parks and scenic rivers for recreation.

young, old, and disabled quietly and economically through some of the last wildernesses most of us will ever know.

On a good day, almost every sandbar will support a tent, and the renewable sands in front of it form a glorious, wild athletic field where the tracks of youth will be erased by the high water of tomorrow, to be ready for a new crop of voyageurs. And back beyond the jungle wall of the swamp forest, the endless rows of pine trees seem not to matter quite so much. What does matter is that, on the eve of discovering one of nature's last wild places, we find ourselves on the verge of losing it.

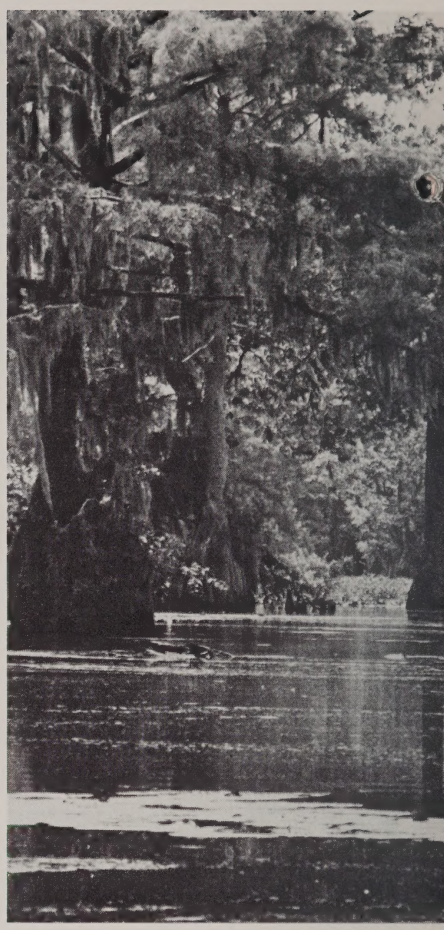
I suggest that we reaffirm our partnership with nature, and that we especially acknowledge our bond with the river swamps. This environment not only cradles our most precious resource, water, but offers us perhaps the last place where we can feel a part of nature—isolated, wild, and free.

Recognition of such a relationship acknowledges the heritage of an environment that was shared by the southern red wolf and the red Americans when Bartram viewed it 200 years ago. Such recognition is not penitence for our exploitation of the river swamp; it is reverence for the qualities which this green world can bring to our lives.

"Why Save Swamps?" was adapted from an article which appeared in the May 1976 issue of *Florida Wildlife*. Special thanks to Dr. Wharton and to the editors of *Florida Wildlife* for their cooperation.

STEPPING BACKWARDS IN TIME

A look at the Conservancy's efforts to preserve southern swamps



by Anne M. Byers
Staff Writer

Since the time America was discovered, the southern swamps have lain isolated off the beaten paths, protective of their great wealth, mysterious and inhospitable. European settlers, who had few swamps in the "old country," found them too formidable and perilous even to explore, so they avoided the swamplands. Unfortunately, as other areas became more heavily settled, people grew courageous and curious. Their gradual invasions of the swamps revealed great still untapped resources—bog iron, oil, timber, minerals, abundant wildlife. The dark black soil (peat) of the bottomlands does not lend itself to crop production; but much damage was done, draining and slicing up the swamps, before farmers understood the futility of their efforts.

Today our southern swamps—like the prairies, coastlines, and forests—are an endangered "species." Most have shrunk to fractions of their original sizes; some have been totally destroyed. Much of our most unusual wildlife, some rare and threatened, are making their last stand in such remaining refuges as the Great Dismal Swamp, Corkscrew Sanctuary, Four Hole Swamp, the Everglades, Pascagoula, the Santee Coastal Reserve, and Green Swamp. For this reason, The Nature Conservancy, along with federal and state conservation agencies and private conservation groups, is attempting to save our remnant swamps and their dwindling wildlife.

Visiting a true swamp can be accurately described as taking a giant step backwards in time. The Great Dismal, which sprawls for about 35 miles along either side of the Virginia-North Carolina border through tide-water country, is a lingeringly primitive wilderness. Probably formed during the period when the glaciers of the Pleistocene were retreating, the swamp is estimated at 8,000 to 10,000 years of age. The towering bald cypress trees of the Great Dismal predate the birth of America; some may be as old as 1,600 years. They rise up from the shallows of Lake Drummond like ancient and eerie sentinels, testimonials to the once vast primeval cypress forest that covered the area.

Lying in the center of the swamp, Lake Drummond is a curious body of water, both for its existence in a bottomland and its possible origins.

In the usual successional series of a swamp, there should not be a persisting remnant of open water like Drummond, unless it was formed *after* the swamp evolved. There are two theories for the lake's formation. First, one geologist suggests that it is the result of a large underground fire (called a peat burn) that burned down through the accumulated peat of the swamp somewhere between 3,500 to 6,000 years ago. Others claim that the lake was formed by the impact of a huge meteor. The lake's oval shape would substantiate both theories. The lake and its canals contain juniper water, which is coffee-colored, though dark yellow in a glass. Its color and flavor are derived from the rich peat and from the roots and bark of gum, cypress, and juniper (white cedar) trees. Juniper is the most palatable of the swamp's dark waters and was often carried in casks aboard sailing ships because it remained relatively free of bacteria for long periods. Some believed that it had medicinal qualities.

The rich waters of the Great Dismal sustain a veritable jungle. Wetter areas contain bald cypress, tupelo, gum, and red maple; drier areas support juniper, pine, and mixed hardwoods. Because the swamp is in a warm temperature zone, it is probably best known among botanists for its extraordinary intermingling between northern and southern plant species. For example, Spanish moss, which is really a member of the pineapple family (a bromeliad), reaches its northern limit in the latitude of the Dismal. Other southern species include yellow jasmine, climbing hydrangea, shining inkberry, French mulberry, bitter pecan, and switch cane. Two beautiful and extremely rare southern plants grow here and there throughout the swamp: wild camellia (*Stewartia malacodendron*) and dwarf trillium (*Trillium pusillum*). The fragile little trillium is included on the federal list of U.S. endangered plants.

Though the wolf, eastern cougar, and spotted skunk are gone, the Dismal boasts bobcat, white-tailed deer, raccoon, gray fox, opossum, weasel, flying and gray squirrel, muskrat, a wide variety of smaller mammals, and some of the last black bear east of the Appalachians. River otters are widely distributed throughout the swamp, but are

so shy that they are seldom spotted. About 75 species of birds are known to nest in the refuge, while a much larger number are migrating visitors. The most phenomenal annual "invasion" of birds occurs in the winter, when up to 25 million blackbirds (about five different species) descend into the high forest canopy. Some of the commonest nesting birds are wood duck, pileated woodpecker, and prothonotary warbler. Two other warblers are relatively rare elsewhere: Wayne's warbler (a race of the black-throated green warbler) and the Swainson's warbler.

The Great Dismal Swamp was established as a wildlife refuge in 1972 through a 49,000-acre gift to The Nature Conservancy from the Union Camp Corporation. Along with several purchases and another donation of 11,000 acres from the Weyerhaeuser Company (given last year under the auspices of the American Land Trust), the sanctuary now contains 89,055 acres. The bulk of the land was transferred to and is managed by the U.S. Fish and Wildlife Service, while the State of North Carolina cares for 7,548 acres.

Another donation of land, this time from a private gun club, created the 25,000-acre Santee Coastal Reserve in South Carolina. Located just north of Charleston, the property includes extensive pinelands, ocean beaches, cypress swamps, and miles of marsh and wetlands. On the high-ground, snipe, quail, and turkey abound, as do deer, bobcat, raccoon, rabbit, otter, and mink. Ducks and waterfowl winter in the Santee's freshwater marshes. It is haven for at least three U.S. endangered species—red-cockaded woodpecker, southern bald eagle, and large loggerhead sea turtle—as well as the threatened alligator.

The cypress-bordered Washo Reserve on the western portion of the sanctuary shelters the oldest known wading bird rookery in the U.S. It provides habitat for white and glossy ibis, heron, wood stork (America's only stork), threatened osprey, and egret. When the feathers of the egret became the epitome of high fashion in the first years of this century, the Santee Club wardens helped prevent extinction of the egret community

Barred owl, Dismal Swamp

Lake Drummond, Great Dismal Swamp

Venus' fly trap, Green Swamp

Yellow pitcher plant, Green Swamp

by watching constantly for poachers on the Washo Reserve. But maintaining and protecting the Santee's waterfowl impoundments and cypress swamps eventually became a more expensive and time-consuming task for the club, and the members decided that another group should take over preservation of the fragile ecosystem. In 1974 the club donated the Santee Coastal Reserve to the Conservancy, which, in turn, transferred 23,000 acres and leased the 2,000-acre Washo Reserve to the State of South Carolina.

The Conservancy has worked in many ways to preserve our southern swamps. In 1954 it assisted the National Audubon Society in acquiring 5,760 acres at the northern tip of what was once part of the Big Cypress Swamp of Collier County in southwest Florida. Now comprising 11,000 acres, the Corkscrew Swamp Sanctuary is often called the crown jewel of America's cypress swamps. It contains one of the largest remaining stands of virgin bald cypress. They are called bald because they are one of the very few conifers that shed their leaves in the winter. Many of the trees are more than 700 years old, rise 140 feet above the swamp floor, and have a girth of 25 feet.

Corkscrew Swamp harbors many plants that are becoming increasingly rare and scarce elsewhere in Florida. Epiphytic plants (those which grow on other plants for support, not nourishment), such as bromeliads and orchids, exist in abundance on the cypress, custard apple, and pop-ash trees. They include the stiff-leaved wild pine, rare yellow catopsis, clamshell orchid, but-

Katydid, Dismal Swamp

Lush vegetation, Four Hole Swamp

The threatened American alligator thrives in river swamps.

Great horned owl, Four Hole Swamp

terfly orchid, the threatened night-blooming orchid, and threatened cow-horn orchid. Endangered Florida royal palms (*Roystonea elata*) grow in the swamp, along with a wide variety of ferns—swamp, strap, wild Boston, leather, royal, and resurrection.

Scattered among huge moss-draped cypresses in the heart of Corkscrew are deeper, black lakes carpeted with water lettuce. These "lettuce lakes" provide feeding areas for several species of water birds. Around the lakes and overhead, one is likely to see common and snowy egret, white ibis, anhinga, great blue and green heron. Little blue herons walk about on the lettuce leaves, picking up insects, minnows, and crayfish. Wood storks nest in the tops of the cypress trees. Hopping here and there among the broad-leaved fire flag plants are peculiar limpkins, which feed mainly on large "bulls-eye" snails. Florida is the only state that has these birds in any number.

Alligators also inhabit the "lettuce lakes" and are often seen sunning themselves on logs or on the lakes' islands of cabbage palms. The swamp's nine species of turtles may become part of the alligator's dinner, though his favorite diet is the garfish that breeds abundantly in the lakes. Snakes and lizards abound in Corkscrew; mammals include gray and fox squirrels, raccoons, otters, bobcats, and black bears.

In another cooperative project, in 1971, the Conservancy and Audubon purchased the 3,415-acre Frances Beidler Forest (Four Hole Swamp), which lies deep in the South Carolina low country. Vying for "crown jewel" title with Corkscrew, Four Hole is a superb example of a black-water swamp, studied by scientists from all over the country. It takes its name from its four spring-fed lakes, which the natives call holes. During the day alligators bask themselves around the holes, while at night they forage in them for gar and crayfish.

Four Hole contains a 1,800-acre tract of bald cypress. It looks like an impenetrable jungle from the exterior; but as you glide in by canoe on one of the swamp's many waterways, the interior opens up into a series of huge and spacious natural corridors and "rooms." On either side, giant cypresses rise up and disappear into the canopy of tupelo and buttressed sweet and black gum trees. Fluorescent moss and an incredible variety and profusion of ferns cover everything—tree trunks, logs felled by time, the massive cypress knees, the moist ground and marly bluffs.

Cypress knees, the outgrowth of the trees' submerged roots, are spectacular in Four Hole, both for their abundance and size. Surrounding the cypresses like small, aged sentries, the knees are pyramidal in shape and some stand six feet tall. Whole forests of these gnarled "creatures" protrude strangely from the dark waters of the swamp. Scientists are still speculating on the actual function of cypress knees, and various theories exist. They may help support the immense cypresses, serve as "snorkels" to take oxygen to the underwater roots, or provide stored nutrients to the trees. Or, they may be no more than a memento of the cypress' evolutionary past.

More than 130 woody plants have been identified in the swamp. Among the herbaceous plants is a rare orchid having limited distribution. The green-fly orchid (*Epidendrum conopseum*), colored a delicate gray-green with touches of purple, grows on hardwood trees throughout Four Hole. It seems to flourish best on the tree limbs that overhang the twisting, meandering waterways of the swamp.

The preserve's varied birdlife can only be excelled by that of untouched areas on South Carolina's coast. Bird counts have included various species of hawks, vultures, owls, woodpeckers, blackbirds, orioles, sparrows, wrens, finches, warblers, and others. White ibis and egrets nest in several rookeries in the swamp; flocks of up to 100 are not unusual. Multi-colored wood ducks winter and nest in the sanctuary, along with mallards, black ducks, and hooded mergansers. Some say that Four Hole is still home for the ivory-billed woodpecker. Professionals question that probability, though the swamp may harbor the rare and endangered Bachman's warbler (*Vermivora bachmanii*). Recently the Conservancy optioned a critical 90-acre tract adjoining the preseve and is attempting to raise the $15,000 to complete the purchase.

Containing more than 30 miles of the Pascagoula River and about 40 oxbow lakes or bayous, the swamplands of the Pascagoula are a treasure trove of rare plants and animals. Two threatened pitcher plants and rare odorless wax myrtle are found in the bay area of the river. Higher elevations support umbrella trees, which are at the limit of their range, and blue needle palms, a threatened species. Green, little blue and great blue herons, wood ducks, barred owls, pileated woodpeckers, prothonotary warblers, and locally threatened swallow-tailed kites are only a few of Pascagoula's many birds. Two rare snakes—the rainbow snake and glossy water snake—have been reported. The rare yellow-blotched sawback turtle lives in the river basin, its only known home. Mammals include deer, beaver, otter, raccoon, muskrat, and mink. Highly uncommon and endangered Florida panthers (*Felis concolor coryi*) have been sighted by several reliable observers.

After three years of complex negotiations, the Conservancy acquired the 32,000-acre wilderness along the Pascagoula in September, 1976, and then transferred the land to the Mississippi Wildlife Heritage Committee for protection. The Pascagoula River bottomlands have been identified as the single most important natural area remaining in Mississippi.

Lying near the mouth of the Altamaha River in McIntosh County, Georgia, Lewis Island is one of the last untouched river swamp systems left in the state. In 1972, at the request of then-Governor Jimmy Carter, the Conservancy assisted the state in purchasing the 6,000-acre swamp from the Georgia Pacific Corporation. Lewis Island supports large virgin stands of tupelo, gum, oak, and bald cypress. It is estimated that there are 2,000 cypress trees over 24 inches in diameter; many larger specimens are 600 to 700 years old. They provide homes for wood ducks, owls, hawks, and a number of woodpeckers. Limpkins, Mississippi kites, and swallow-tailed kites—all locally rare—find shelter in the sanctuary. Black bears, which are rare in the southern lowlands, have been reported to inhabit the island swamp.

Black bears also range throughout Chowan Swamp, as evidenced by the shredded, clawed bark on "bear trees," and the bear tracks along muddy stream banks when the tupelo and gum trees drop their ripe fruit. In spring 1976, Union

Camp—the same donor of the first Dismal Swamp acreage—donated the North Carolina swamp via the American Land Trust to the Conservancy. The 3,800-acre refuge harbors one of the few stands of bald cypress in the state. Wood ducks and hooded mergansers paddle about in the densely shaded creeks; endangered red-cockaded woodpeckers (*Dendrocopos borcalis*) occasionally can be heard hammering away on their favorite trees. The Conservancy conveyed Chowan Swamp to the North Carolina Forestry Foundation for use by the North Carolina University System as a public environmental studies center.

North Carolina also contains the Conservancy's most recent swamp acquisition, an area that is unique for its ecological value. This summer the Federal Paper Board Company, Inc., donated 13,850 acres of the Green Swamp to the Conservancy with the endorsement of the American Land Trust. Lying in the southeast coastal plain of the Carolinas, the tract is the most biologically significant portion of the swamp, and has been designated a National Natural Landmark by the National Park Service.

Green Swamp is an unusual mosaic of wetland vegetation communities. Its four plant communities support 5 endangered or threatened plant species, 12 species of rare and unusual plants, and 14 species of insectivorous plants. The Venus' flytrap (*Dionaea muscipula*), one of the most notable species, is protected by law and found only in parts of the Carolinas. A carnivorous plant, the fly-trap has highly modified, hinged leaves that trap insects and even small frogs. Other state endangered or threatened flora that flourish undisturbed in the swamp are the sweet pitcherplant, swamp tickweed, sneezeweed, and yellow fringeless orchid. Green Swamp also harbors alligator and black bear, and several sightings of the endangered eastern cougar (*Felis concolor cougar*) have been reported.

Farther north, in Maryland, lies the Battle Creek Cypress Swamp, only about an hour's drive from the nation's capital. It is the northernmost East Coast swamp in which bald cypress grows. Furthermore, the swamp's trees comprise one of only two cypress stands remaining in the entire state. The other survives along the Pocomoke River on the Eastern Shore of Maryland.

Swamp-dwelling birds include the swallow-tailed kite (above), endangered in several states, and the wood stork (right), the only stork found in the U.S.

1977 ANNUAL MEETING

October 20-22 • Charleston, South Carolina

Drawing by Sam Cravotta

OFFICIAL NOTICE

Notice is hereby given to the members of The Nature Conservancy that, pursuant to Article VII, Section 2 of the Bylaws of The Nature Conservancy, 1976 Revision, a membership meeting will be held at the Mills Hyatt House, Charleston, South Carolina, at 8:45 AM on October 22, 1977, for the purpose of receiving reports, electing Officers and Governors of The Nature Conservancy for the ensuing year, and acting on such other business that may come before the meeting.

Please note the enclosed official ballot. It should be signed and returned as described therein.

Patrick F. Noonan, President

1977 ANNUAL MEETING

October 20-22 • Charleston, South Carolina

TENTATIVE SCHEDULE FOR MEMBERS REGISTERED TO ATTEND

Wednesday, October 19 (for early arrivals)

5:00-7:00 PM Registration — Mills Hyatt House, Meeting & Queen Streets

Guided tours of historic Charleston by private car with visits to several homes and gardens may be arranged for any time before or after the meeting through Mrs. I. Mayo Reed, 103 Tradd Street, Charleston, South Carolina 29401, (803) 722-8539. $10 per hour.

Guided tours of the Marine Resources Center may be arranged for any time before or after the meeting by writing the Director, Dr. Edwin B. Joseph, Box 12559, Charleston, South Carolina 29412. No charge. The Center is at Fort Johnson on Charleston Harbor, about 20 minutes by car or taxi from the Mills Hyatt House.

A limited number of float trips in Four Holes Sanctuary-Frances Beidler Forest may be arranged before or after the meeting by contacting Tim McCall at the Conservancy's Atlanta office, 148 International Blvd., NE, #450, Atlanta, GA 30303, (404) 659-0240.

Thursday, October 20

9:00-11:00 AM Registration — Mills Hyatt House

TOUR A

9:00-11:00 AM Guided walking tour of historic Charleston leaving from Mills Hyatt House

12:30 PM Field trip to and guided tour of Four Holes Sanctuary-Frances Beidler Forest, one of the last primeval blackwater swamps. Lunch en route.

5:00 PM Arrive Mills Hyatt House

TOUR B

8:30 AM Depart by bus for South Carolina Marine Resources Center

9:00 AM Tour of Center

11:00 AM Boat trip to Capers Island, a classic barrier island; picnic lunch and guided tour

3:00 PM Return by boat to Marine Resources Center

5:30 PM Arrive Mills Hyatt House

7:00 PM Cocktails — Hibernian Hall, 105 Meeting Street, an historic building of 1841, adjacent to Mills Hyatt House.

8:00 PM Awards Dinner — Hibernian Hall

Introduction of distinguished guests and the Board of Governors of The Nature Conservancy

Presentation of 1976 Oak Leaf Awards, President's Stewardship, and Chapter Awards.

Remarks by the Governor of South Carolina, the Honorable James B. Edwards

Friday, October 21

8:45 AM Field trip to Santee Coastal Reserve — 23,000 acres of cypress trees, salt and freshwater marshes, habitat of bald eagles, osprey, egrets, and other wildfowl.

12:30 PM Shellfish picnic, as guests of the South Carolina Wildlife and Marine Resources Department

3:30 PM Arrive Mills Hyatt House

4:30-5:30 PM Presentation by a panel of members of prize-winning chapter projects, old and new, with slides and descriptions — Mills Hyatt House

7:00 PM Cocktails — Colony House, 35 Prioleau Street, a fine old Charleston restaurant.

7:45 PM Dinner at Colony House.

Saturday, October 22

8:45 AM Annual Business Meeting

Mr. William D. Blair, Jr., Chairman of the Board of Governors, presiding

Election of Officers

Report by Mr. Patrick F. Noonan, President, The Nature Conservancy. Illustrated with slides of new projects and programs

10:45 AM Departure for Drayton Hall, an historic house owned by the National Trust for Historic Preservation. One of the most beautiful houses in America.

12:45 PM Visit Middleton Place, Magnolia Gardens

1:00 PM Picnic lunch in the gardens

2:00 PM Tour of gardens

4:30 PM Arrive Mills Hyatt House

6:30 PM Cocktails as guests of a number of members of the Board — South Carolina Society Hall, 72 Meeting Street

8:00 PM Annual Meeting Dinner, Hibernian Hall

Guest Speakers: The Honorable Cecil Andrus, Secretary of the Interior; The Honorable Joseph Riley, Jr., Mayor of Charleston; and The Honorable Nathaniel P. Reed, Honorary Chairman, the American Land Trust.

Please clip and save

OFFICIAL BALLOT

Name (please print) _____

Address _____

_____

Signed _____

A valid ballot can be executed only by a member in good standing. To cast your vote for slate of officers and governors proposed by the nominating committee, return signed ballot to The Nature Conservancy. To allow sufficient time for processing, ballots should be received by October 14, 1977.

PROPOSED BY THE NOMINATING COMMITTEE FOR ELECTION TO THE BOARD OF GOVERNORS:

NOMINATED AS OFFICERS

John E. Andrus III, Minnesota, current vice chairman, nominated as chairman. President Deep Draw Corporation, trustee Minneapolis Society of Fine Arts, member of the Conservancy's Minnesota Chapter.

Frank D. Boren, California, current vice chairman, is renominated. Attorney, trustee Conservancy's Southern California Chapter, member Sierra Club, partner of law firm Paul, Hastings, Janofsky.

The Honorable Thomas McCall, Oregon, current member nominated as vice chairman. Former Governor of Oregon, presently professor, Oregon State University, member of the President's Citizens Advisory Commission on Environmental Quality.

The Honorable Nathaniel Pryor Reed, Florida, current member, nominated as vice chairman. Former Assistant Secretary of the Interior for Fish and Wildlife and Parks. Amateur botanist, ichthyologist, and biologist. Past chairman for the Department of Air and Water Pollution Control in Florida and an advisor on environmental matters for three Florida governors. Honorary chairman, American Land Trust.

Charles C. Haffner III, Illinois, current vice chairman, nominated as treasurer. Former chairman and treasurer of the Illinois Chapter of The Nature Conservancy. Vice president and treasurer of R. R. Donnelley & Sons Co., trustee of Morton Arboretum.

Robert B. Anderson, New Mexico, current member, nominated as secretary. President of the Lincoln County Land and Cattle Company. Graduate of Cornell in animal sciences. Former member of the Peace Corps and technical advisor to the government of Colombia. Active in New Mexico conservation and historic preservation.

NOMINATED AS MEMBERS OF THE BOARD

Robert Bennett, Washington, D.C., current treasurer. Executive vice president of Federal National Mortgage Association, graduate of Harvard College, Columbia Law School, and Harvard Graduate School of Business Administration.*

William D. Blair, Jr., Maryland, current chairman. Senior official with U.S. Department of State, former journalist. Ardent conservationist. Past president of Audubon Naturalist Society of Central Atlantic States. Trustee of the Conservancy's Maryland Chapter.*

Mrs. Helen Black, Ohio, presently chairman of Ohio Chapter of the Conservancy, active in conservation groups, including Ohio Environmental Council; board member, Advisory Council on Little Miami River, Ohio Department of Natural Resources. Board member, Central Psychiatric Clinic and Medal of Merit recipient, Garden Club of America.

The Honorable Robert O. Blake, Washington, D.C., former Foreign Service officer with ambassadorial rank, and senior advisor on International Environmental Affairs to the Director of the Environmental Protection Agency. Active naturalist and participant in Washington, D.C., area Conservancy activities.

Alexander Calder, Jr., New Jersey, Chairman, Union Camp Corporation, director of several companies, including Burlington Industries, Bank of New York Company, Inc., and Ingersoll-Rand. An active conservationist, he is a member of the National Committee of the American Land Trust.

William DeSousa, Connecticut, vice-president, Connecticut Conservation Association. Past chairman, Conservancy's Connecticut Chapter, former executive, General Electric Company, Sperry Rand Corporation.*

John H. Filer, Connecticut, Chairman Aetna Life and Casualty, member American Land Trust National Committee, supporter of the Canton Land Trust. Active in many charitable and public committees in Connecticut, he is also a trustee of Mt. Holyoke College and a director of U.S. Steel Corporation. Strong supporter of The Nature Conservancy and American Land Trust.

Dr. Richard Goodwin, Connecticut, active leader in the Conservancy since its earliest days. Fellow, American Academy of Arts and Sciences, president of Conservation and Research Foundation, professor of Botany, Connecticut College.*

Charles Hedlund, New Jersey, president of Esso Middle East and vice president, Middle East of Exxon Corporation. Member of American Land Trust National Committee and National Audubon Society.

Kenneth E. Hill, California, consultant to Blyth Eastman Dillon & Co., formerly vice president in charge of petroleum activities at Chase Manhattan Bank, currently director Standard Oil Company of California. Author and active conservationist.

Roy E. Larsen, New York, vice-chairman, Time, Inc., honorary trustee, New York Public Library, former trustee, Ford Foundation, chairman, Board of Nantucket Conservation Foundation.*

John B. Oakes, New York, editor, *The New York Times,* A.B. Princeton, A.M. (Rhodes Scholar) Oxford, former member of Board of Directors, Sierra Club, former trustee, Natural Resources Defense Council.*

The Honorable Francis W. Sargent, Massachusetts, former Governor State of Massachusetts, served as head of environmental bodies including Atlantic States Marine Fisheries Commission, Massachusetts Department of Natural Resources, and director of the Outdoor Recreation Resources Review Commission.*

Richard S. Weinstein, Florida, current secretary. Attorney, senior partner Weinstein, Shields, Schaffer Hirsch and Lev. Former staff member for two Connecticut governors. Active in conservation litigation.*

Mason Walsh, Jr., Pennsylvania, recently appointed to fill a vacancy created by the resignation of Mr. Warren Lemmon, nominated to fill the remainder of Mr. Lemmon's term. Vice President and general counsel, Richard K. Mellon and Sons. Trustee of several charitable trusts and foundations, and the Western Pennsylvania Conservancy. Active conservationist.

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*Current member renominated.

Bald cypress is highly valued as timber. Consequently, the Battle Creek cypresses are third-growth trees. To stop further inroads into the swamp, the Conservancy and the Maryland State Garden Clubs combined forces in 1965 to buy the 100-acre bottomland and establish it as a preserve. Today, despite past cuttings, some of the cypress trees reach heights of over 100 feet and are about 50 to 100 years old. Owned by the Conservancy, the area is leased to Calvert County for management.

There is another southern swamp that deserves attention, particularly because it isn't in the South. Located at the very bottom tip of Illinois between the Mississippi and Ohio Rivers, the Little Black Slough is a true black-water southern swamp. Like Four Hole, the slough is best traveled by canoe. If you enter at dusk, skimming along on the quiet murky waters of the Cache River, you might glimpse an endangered Indiana bat (*Myotis sodalis*) as it sweeps over the water, catching insects. Walls of tall, dark brown tupelo trees line both sides of the river. All around, the moist night air gradually becomes filled with chorusing bird-voiced tree frogs and screeches of the rare yellow-crowned night heron. The bird shares the 1,110-acre Heron Pond State Nature Preserve, adjacent to the slough, with other heron species.

Goose Pond, on the northern edge of the preserve, is dominated by enormous bald cypress trees. Their hollowed trunks are so large—often exceeding 14 feet in circumference—that Indians and fur trappers used to take shelter inside them during foul weather. Like most cypress swamps, the pond is characterized by cypress knees, which form rings around the trees.

Little Black Slough harbors many other flora that are much more representative of the southern coastal plain. Chestnut oaks, cherrybark oaks, pin oaks, huge Drummond's red maples, and overcup oaks fringe the slough. On the other hand, Boss Island, a 500-acre island in the center of the swamp, contains some of Illinois' finest old-growth forest of northern tree species. The limbs of upland oaks and hickories (northern species) growing on the edges of the island actually overlap with those of the bald cypress and water tupelo (southern species) reaching up from the slough below.

At least 15 species of the swamp's plants and animals are considered locally or nationally rare. Uncommon animals include bantam sunfish, mole salamander, pileated woodpecker, and Swainson's warbler. Egrets, bitterns, and a variety of ducks and geese also nest throughout the preserve.

The State of Illinois was able to purchase and preserve Heron Pond, but was unable to obtain

Little Black Slough, though located in Illinois, is a true blackwater southern swamp.

the entire ecosystem, including Little Black Slough. Therefore, in 1976 the Conservancy bought the 3,600-acre slough for the Illinois Department of Conservation. It was, and still is, the largest single acquisition for conservation in the state's history. A remaining fund-raising goal of $160,000 must be met in order to permanently protect this unique area.

Long after visiting a swamp, you find that it lingers in your mind. You remember the brilliant butterweed that colors Four Hole from March to May, a surprise glimpse of a group of frolicking river otters in the Great Dismal, the bald cypress in Little Black Slough that made you feel dwarfed and insignificant, the sudden rush of wings overhead as a flock of egrets took to the air in the Santee, a floating log in Corkscrew Swamp that turned out to be a huge bull alligator, the profusion of rare and exotic plant life of the Green Swamp.

The beauty and diversity of our swamps is haunting, mysterious, unforgettable . . . but also somewhat saddening. They remind us that many of these isolated wildernesses are all that survive of the originally vast primeval swamps and towering cypress forests that greeted the first curious settlers. Cherish the last swamps, for their remains have been hard won.

Georgia plume

Rarest of the Rare

by John V. Dennis

Lost franklinia

Within the depth of southern swamps are species of animals and plants so rare that the loss of a few individuals would spell their destruction. Now that southern swamps are beginning to receive the protection they deserve, some of these rarest of the rare will be saved. For several plants, however, extinction seems to have been around the corner even before the white man set foot on this continent.

This was probably true of two flowering shrubs that grew close to the banks of the Altamaha River in Georgia. One, the "lost" franklinia, no longer present in the wild, has had as romantic a history as any plant known. The other—thanks to conservation efforts—is still with us in its native habitat.

In 1765 the two famous father and son botanists, John and William Bartram, discovered a plant growing near Fort Barrington on the north bank of the Altamaha that they immediately recognized as new to science. It was a shrub or small tree belonging to the tea family. In subsequent travels, the two botanists looked in vain for more specimens of the plant. After a lapse of eight years, the younger Bartram, William, returned to the original site and procured plants that were then set out in the Bartram garden near Philadelphia. At least one plant survived, and thanks to this success, it was possible later on to introduce franklinia into cultivation.

Today the lovely camellia-like fall blossoms of the plant are seen in many parks and gardens. Had William Bartram failed to return to the Altamaha site or had his seedlings failed, the world would have been that much poorer. Apparently Dr. Moses Marshall, who visited the site on the Altamaha River in 1790, was the last botanist to see the plant growing in the wild. It will never be known whether the wild stand (only two or three acres in extent) was wiped out "through the rapacity of collectors," as some claim, or through some other cause. Repeated attempts to find the plant again in the wild have failed. Quite appropriately, the plant is called the lost franklinia.

The other rare flowering shrub of the Altamaha was associated more with sandy ridges than wetlands. Called the Georgia plume (*Elliottia racemosa*), it was described in 1817 by the South

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A free-lance writer, Mr. Dennis is the author of *A Complete Guide to Bird Feeding* (Alfred A. Knopf, Inc., 1975) and co-author with Dr. C. R. Gunn of *World Guide to Tropical Drift Seeds and Fruits* (Quadrangle, The New York Times Book Co., 1976). He discusses the ivory-billed woodpecker's past and its chances for the future in an article that will appear in a forth-coming issue of *Living Wilderness.*

Carolina botanist, John Elliott. For a time it looked as though Georgia plume, a primitive member of the heath family that grows to a maximum height of about 15 feet, would vanish without a trace. Unlike franklinia, it did not respond to cultivation. Soon after being discovered, the plant disappeared from the type locality. Since then the Georgia plume has disappeared and then been rediscovered not once, but several times. At present it is known to exist in only a few localities of Georgia.

The grandest stand by far is in a 750-acre wild area known as the Phillips Tract. Located on the north side of the Altamaha River Swamp and only 30 to 35 miles upstream from old Fort Barrington, the stand brings back memories of the Bartrams and the lost franklinia. The preserve contains the largest known breeding population of Georgia plume and the state's largest stand of myrtle oak (*Quercus myrtifolia*), which exists near its northern range limits. In 1973 The Nature Conservancy assisted the State of Georgia in acquiring the Phillips Tract as a part of its Heritage Trust Program. The area was dedicated as a National Landmark on June 25, 1977.

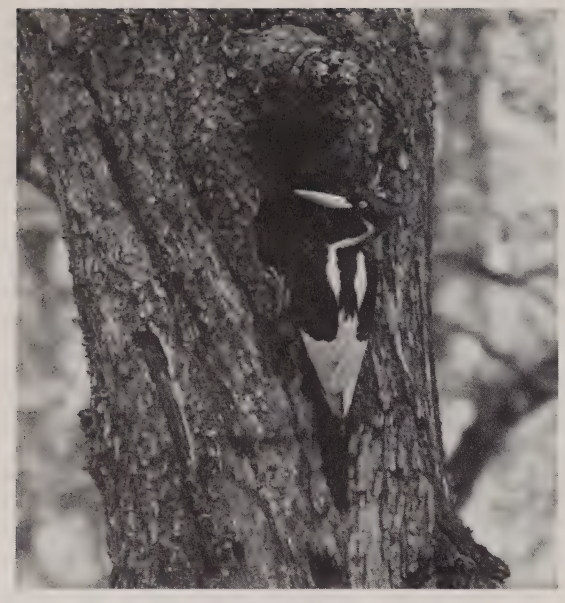
Also, in 1964, a gift of 72 acres in Candler County, Georgia, enabled the Conservancy to establish the Charles Harrold Nature Preserve. Comprised of sandhills, forestland, and swamps, the area was preserved to protect its unusually large stand of Georgia plume.

Sometimes the rarity of a plant, and even its existence, is a matter of dispute. This is the case regarding a trillium that was once thought to be restricted to one small area in the Virginia part of the Great Dismal Swamp. Included on the Federal list of endangered plants, *Trillium pusillum* var. *virginianum* was described about 35 years ago by the botanist Merritt L. Fernald. Impressed by the plant's small size (it grew to a height of about 12 inches), Fernald regarded it as a variety of a more widespread but nevertheless rare southeastern trillium (*T. pusillum* var. *carolinianum*). Both trilliums are found in swampy places close to water but not in very wet ground. The flowers are snow white when they first appear, then they turn blue and finally violet.

Recently the variety status of the Dismal Swamp plant has been questioned. According to Dr. Gerald F. Levy, Director of the Dismal Swamp Programs in Norfolk, stunted growth is not unexpected in plants growing in highly acid, peaty soils such as those of the Great Dismal. Therefore, the smaller measurements of the plant may merely reflect the environmental conditions under which it lives and do not necessarily indicate genetic differences. But the matter is far from settled. Other stands of the dwarf trillium have been found elsewhere in Virginia. Are these plants also stunted because of their environment? The matter is being looked into at two different Virginia colleges. It is fortunate that the original stand in the Great Dismal Swamp is still present as a reference.

The southern swamps are also a haven for rare birdlife. When wandering in extensive swamps such as the Great Dismal, Okefenokee, or Big Cypress, you half expect a flock of passenger pigeons or Carolina paroquets to fly over. The last passenger pigeon died in the Cincinnati Zoo in 1914, but it is not known with any certainty when the Carolina paroquet disappeared. Most accounts say that the last flock was seen in 1920 near Fort Drum in the Lake Okeechobee region of Florida. Then, in the mid-1930's, reports of birds said to be Carolina paroquets trickled out of a large swampy region on the lower Santee River in South Carolina. While engaged in a wild turkey project in the area in 1933 and 1934, a game warden named George M. Melamphy first reported seeing ivory-billed woodpeckers and then Carolina paroquets. The presence of ivory-bills was verified in May, 1935, by South Carolina's noted ornithologist, the late Alexander Sprunt, Jr. But when Sprunt went so far as to verify Melamphy's claim that there were Carolina paroquets in

Carolina paroquet



Ivory-billed woodpecker

the Santee swamps, a number of eyebrows were raised. The story seemed too fantastic. Sprunt's detractors suggested that he may have seen a flock of escaped foreign parrots.

It is my feeling that Sprunt probably did see a last flock of Carolina paroquets. He was one of the South's most respected and competent field observers, and, if anything, he always leaned on the side of being overly cautious in reporting rare birds. Furthermore, escaped members of the parrot family almost invariably head for a built-up area and not a remote swamp. Whatever the case, the Carolina paroquet is no longer with us today. Too many of us have visited the southern swamps without seeing or hearing this brightly colored member of the parrot family.

Perhaps no nearly extinct species has been more closely identified with southern swamps than the ivory-billed woodpecker. It was in the southern swamps that early ornithologists, like Wilson and Audubon, found the bird. Already seriously harassed by the American Indian, who wanted the bill and skin for trophies, the ivory-bill retreated ever deeper into the swamps. Its next enemy was the white man who wanted the bird for much the same reasons as the Indian. Also, the museum collector was probably the most relentless enemy of all. With the opening up of the big swamps through lumbering operations, the woodpecker was more than ever at the mercy of armed hunters. By 1900, the ivory-bill was so rare that any sightings of the bird were open to suspicion. The pileated woodpecker, then, as now, was often confused with the ivory-bill. Both are large woodpeckers that look much the same at a distance.

During the period 1932 to 1942, a small ivory-bill population was under observation in a heavily timbered swamp in northern Louisiana known as the Singer Tract. Here, for the first time, the ivory-bill was studied in some detail. Thanks to the work of Dr. James Tanner, we know something of the life history of this rare woodpecker. The birds seemed to subsist largely on grubs and certain beetles that live in newly dead timber. When the food supply was inadequate, the ivory-bill moved on to a new source. Semi-nomadic and avoiding, as much as possible, the presence of man, the habits of the ivory-bill were not compatible with the times. The large areas of undisturbed forested swamps that the birds needed were rapidly being developed.

During the 35 years since the ivory-bill was observed in the Singer Tract, there have been a number of new sightings. Always these have seemed to be of single birds or a pair on the move —never of birds in a settled population. I was fortunate enough to see an ivory-bill in the upper Neches River swamp in eastern Texas in December, 1966. My sighting, along with several others I know of, was within the once great wilderness area of Texas known as the Big Thicket. Saving the ivory-bill has been a motivating factor in establishing the Big Thicket National Preserve.

Like the ivory-bill, the Bachman's warbler (*Vermivora bachmanii*) requires sizeable tracts of wild swampland. The mere mention of this bird evokes recollections of Audubon and his close friend, the Rev. John Bachman of Charleston. Audubon was suitably impressed when Bachman

Bachman's warbler

discovered the warbler in 1833. Even in those days the discovery of an entirely new bird species was an exciting event.

In describing the bird, Audubon called it "Bachman's *swamp*-warbler." The name is appropriate since, during its breeding season, the bird, with few exceptions, is found only in southern swamp forest. Similar to several other swamp species, Bachman's warbler promptly dropped out of sight after its discovery and remained almost unknown for 50 years. Then, for an extremely rare species, it appeared in almost incredible numbers. During a brief period in March, 1890, no less than 46 specimens were taken along the lower Suwanee in Florida by two museum collectors. The bird also reappeared near Charleston. Between 1906 and 1919, Arthur T. Wayne, a leading South Carolina ornithologist, discovered 32 of the 36 Bachman's warbler nests known to science. All were in a heavily timbered area to the northeast of Charleston known as the I'On Swamp. After 1920, however, Bachman's warbler again went into eclipse. It has resumed its extremely rare status—sometimes years go by without any sightings of the bird at all. Preservation of its nesting habitat is the only known way of helping this small warbler.

Many common names have been given to *Felis concolor*—cougar, panther, puma, mountain lion—depending on the part of the country it inhabits. Of the 30 known subspecies (15 of which exist in North America), 2 occur in the east: the Eastern cougar (*Felis concolor cougar*) and Florida panther (*Felis concolor coryi*). The range of the two subspecies may overlap in the southeastern states. Once extremely widespread in the east, the cougar or panther ranged from the top of Maine to the tip of Florida. But with persecution, it has, like several other species, retired to the southern swamps as a last refuge. It is now so rare that sightings are few and far between, and states such as Florida and North Carolina are working diligently to gather information on the status of the cat within their borders.

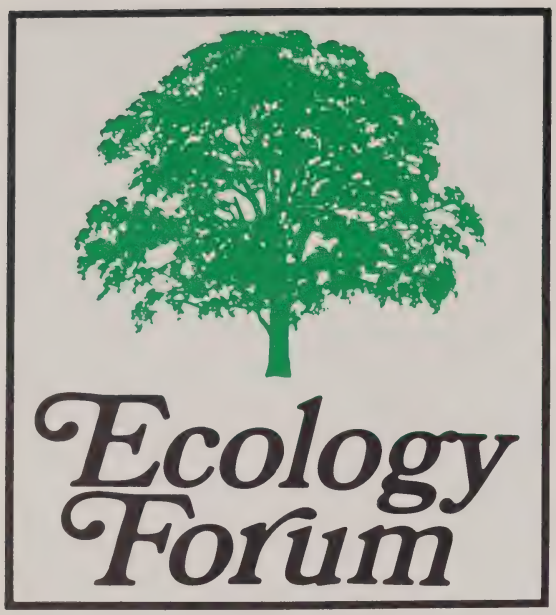
In North Carolina, David S. Lee, Curator of Birds and Mammals at the State Museum of Natural History, administers a continuing panther study that was begun in 1975. The preliminary results of the study show that most of the accumulated data are based on sight reports. Since part of Green Swamp in southeastern North Carolina is a recently and officially preserved area, I asked Mr. Lee about sightings of panthers in the 300,000-acre swamp. Most of the reports, he said, are not recent, but 5 to 15 years old. An adult panther with young was spotted in the swamp in 1966; single cats were reported in 1964 or 1965,

Eastern cougar

1968, and 1974. Additional sightings in the rest of the county, such as around Lake Waccamaw, were made in the 60's and early 70's. Officials at the Federal Paper Board Company, which donated over 13,000 acres of the Green Swamp to the Conservancy, also have records of three reported sightings in 1975, about five miles from the swamp, and an on-site report in 1971.

Though many of the reports are from very reputable sources, such as game biologists and game wardens (as in the case of the adult with young) and from well detailed accounts, such documented proof as hair samples, casts or photographs of tracks, scats, recordings of screams, pictures or descriptions of a panther's typical kill, and photos of cougars are virtually nonexistent. However, according to Mr. Lee, despite the lack of solid evidence, reportings of panthers in North Carolina are showing a definite pattern that suggests the possibility of small permanent populations in several parts of the state.

Though the Eastern cougar and Florida panther probably still occur in North Carolina, Florida, and Mississippi—and sight reports exist for Alabama, South Carolina, Tennessee, and Virginia—the large native cat will never again be common anywhere in the eastern United States. Only by preserving our remaining swamps and other natural areas can we save what we hope is still left of our country's rarest of the rare.



No. 24

By Norman L. Brunswig
Sanctuary Superintendent
Frances Beidler Forest (Four Hole Swamp)

MANAGEMENT OF SOUTHERN SWAMP SANCTUARIES

For the first 175 years of our country's history, the southern swamps were treated almost as a commons—used by anyone who wanted to venture inside, regardless of ownership. Owners often considered their swamps worthless, and frequently denied their ownership to avoid paying taxes, especially during difficult times like Reconstruction and The Great Depression. Some bottomlands were sold to pay taxes; others were deeded by county sheriffs to anyone who would assume future tax liabilities.

The history of our swamplands' vague ownership was also compounded by generations of haphazard surveying. After all, it is difficult to determine the boundaries of a flooded swamp. Furthermore, "who really cares about a few acres of bog, one way or the other," seems to have been the prevailing attitude.

Nowadays, timber prices are skyrocketing, particularly for cypress. In addition, we are becoming increasingly aware of the ecological, educational, and recreational values of our swamps. As a result, swampland owners are suddenly appearing and so are some rather complex title problems. The first and most important tasks of a swamp manager, therefore, are to locate and mark the sanctuary's borders, and possibly untangle a few tough title problems.

The second task is becoming acquainted with neighbors. Acquiring land for preservation is often a controversial issue, and the emotional climate that surrounds some conservation efforts generates misinformation. Sometimes adjacent landowners fear that their land will be condemned for addition to the sanctuary. Private organizations have no powers of condemnation, but it may help relations to allay neighbors' concerns.

Developing and maintaining good relations and open communications with surrounding landowners is essential, particularly in the case of privately controlled preserves where resident staffs are usually quite small. Goals and policies for the sanctuary should be explained. Cooperative neighbors can help attain management objectives, such as controlling trespass and other illegal activities, like hunting and timber theft. Because most swamp tracts are remote and rarely adjacent to public roads, adjoining landowners often hold the key to access as well. By exploring areas of common interest, such as forest fire protection, and road and boundary maintenance, the manager may be able to involve neighbors in some phases of sanctuary management.

The next step is determining concise management objectives for the swamp sanctuary. The reason for preserving an area often makes the broad goals obvious, as in setting aside a swamp that harbors a rare bird species. In this case, the sanctuary is managed primarily to maintain or enhance the bird's habitat. Establishing objectives for other preserves is not always as simple.

Management approaches can be either active or passive, or a mixture of the two. A strictly passive approach might mean monitoring the situation and "letting nature take its course." Some of the giant wilderness areas of the West are essentially managed in this way. Active management, on the other hand, implies actual human involvement to maintain the status quo for a sanctuary's plant and animal life. For example, wildfire at Corkscrew Swamp Sanctuary in Florida has been a natural, historical occurrence. Both the slash pine-palmetto community of the drier hills and ridges and the herbaceous grass-sedge community of the great marshes were maintained by occasional wildfires. In an effort to preserve

the original character of these areas, and therefore the diversity of the swamp, periodic controlled fires are set in the sanctuary.

Corkscrew is also actively managed for wood stork. Storks require large quantities of food while they are fledging their young. The bird's nesting activity is directly correlated with low water conditions. When water is shallow, storks can gorge themselves easily on fish concentrated in the small remaining swamp pools. However, if heavy rains occur during the time that young birds are being cared for by adults, fish populations are dispersed. Less food results in very poor reproductive success. To hedge against this possibility, the Corkscrew staff maintains several man-made fish ponds that can be systematically drained to create good stork-feeding habitat.

Water and trees are the elements common to all swamps, whether they are mangrove swamps in South Florida or cypress swamps in Virginia. In some swamps, like the Carolina Bays and Florida cypress domes, there is little water flow. Ground water simply seeps through the soil to the lower swamp from the surrounding uplands. Others, like the great overflow swamps of the Congaree River in South Carolina and the Altamaha River in Georgia, are seasonally inundated by flooding rivers. In both types of swamps, the quality and quantity of the water entering the bottomlands are the most important variables influencing the health of the swamp systems. Since many activities can alter both water quality and quantity, swamp managers must be acutely sensitive to these factors.

Water quality may be directly monitored by taking routine systematic samples of the water and determining values for numerous basic parameters, such as pH, dissolved oxygen, and temperature, or pollutants, like heavy metals and pesticides. One distinct limitation to this direct approach is that since there are so many potential pollutants, it is impossible to monitor for them all. For this reason, an indirect monitoring program may be desirable.

A vast array of aquatic insects and other invertebrates inhabit swamp waters. Many of these animals have very low tolerances to water pollutants and narrow ranges of tolerance to changes in their physical environment, such as increased water turbidity. By closely observing changes in these animal populations, one can indirectly monitor the water quality and, therefore, the biological health of the swamp. At the Frances Beidler Forest (Four Hole Swamp) in South Carolina, direct water quality sampling is complemented by quarterly sampling of the aquatic invertebrate fauna.

Not only is water quality important, but also quantity and seasonal distribution. Swamps evolved with certain natural patterns of watering and dewatering, and activities that permanently alter these cycles will certainly alter the swamp. Upstream and surrounding land-use changes and flow modifications often have profound impacts on the downstream or adjoining swamps. For example, a stream channelization project, designed to drain rainwater off the land rapidly by deepening and straightening the creeks that feed the swamp, will put more water in the swamp, but for a shorter period of time. On the other hand, an upstream dam might remove the "peaks and troughs" from the swamp water depth chart, causing a more evenly distributed supply of water. One possible effect of a dam could be the loss of cypress reproduction. Because cypress seeds require moist unflooded soil on which to germinate, less fluctuating stream levels could shorten or eliminate critical dry periods and inhibit the reproduction of this important tree in the wettest habitats.

Who visits the swamp also plays a major role in making management decisions for the sanctuary. The greatest source of support for the preservation of a swamp, or any natural area, is an informed and aroused public. There are many reasons why the public should be invited to the sanctuary—to learn about the swamp, to enjoy and appreciate its beauty and diversity. But making visitors feel that "it's their swamp too" is sufficient reason. Then the public shares the pride of the area being made a Natural Landmark, or the outrage of having it polluted or threatened with drainage.

As with every other major management decision, the choice to allow visitors depends on the ecological fragility of the individual preserve. Some areas cannot stand even modest levels of human activity. If the sanctuary being considered is a rookery for an endangered bird, for example, many guests would probably discourage nesting. Or, an area containing the last individuals of a rare wildflower would warrant special consideration. The point is that when the public is allowed to visit swamp sanctuaries, most guests leave with an improved attitude towards our much maligned swamplands.

Virgin southern swamplands once covered millions of acres from west of the Mississippi to the Atlantic Coast. Now only a few thousand scattered acres are left. The remaining swamp sanctuaries are no less important than a block of antebellum buildings in Charleston or Savannah—they are priceless pieces of our natural and cultural heritage.

NEW PROJECTS

Arizona

BILL WILLIAMS RIVER (Mojave and Yuma Counties). In cooperation with the U.S. Fish & Wildlife Service, the Conservancy purchased 1,160 acres consisting of river valley bottomlands, desert uplands, and pastureland. The area is considered unique since it provides a reliable source of year-round water within a desert environment. The overlapping of steep-walled desert uplands with a riparian valley creates a rich array of niches suitable for supporting a variety of life. Over 250 species of birds, including 25 waterfowl species, use the area for nesting, wintering, or as a migratory stop-over. The Fish and Wildlife Service will include the land in the Havasu National Wildlife Refuge.

Colorado

GORE CREEK DEER RESERVE (Eagle County). The reserve is a key part of a major mule deer migration corridor. The 3.5-acre tract, covered with lodgepole pine, aspen, and serviceberry, will be transferred to and managed by the Colorado Division of Wildlife.

Florida

BIG CYPRESS SWAMP—Addition—(Collier and Monroe Counties). The Conservancy purchased 4 more acres in cooperation with the National Park Service as an addition to the Big Cypress National Freshwater Reserve. To date, the Conservancy has acquired 650 acres towards creation of the Reserve, which is a principal watershed of Everglades National Park.

JANET BUTTERFIELD BROOKS PRESERVE (Hernando County). Mrs. Janet Butterfield Brooks has donated an additional 10-acre tract, which will eventually be part of a 90-acre addition to the preserve. Presently totaling 260 acres, the preserve consists of a mixture of high hammock, longleaf pine, and turkey oak uplands, and contains two small freshwater ponds. Animals typical of the area are gray fox, fox squirrel, cat squirrel, bobcat, raccoon, opossum, and armadillo. Because it has been protected by the Brooks family for many years, the preserve shows very little human disturbance.

ORANGE LAKE (Alachua County). A gift of the Context Development Corporation, the 815-acre area contains two unique ecosystems—a palm hammock and a small cypress head—and supports a wood stork rookery as well as several alligator nests. Osprey inhabit the tract, and bald eagles hunt in the area. The property, which lies in the

floodplain of Orange Lake, includes a blackwater river, wet prairie, open lake, and rolling uplands. An American Land Trust project, the preserve will be transferred to the Florida Game and Freshwater Fish Commission.

Georgia

SAVANNAHS AT GENESIS POINT (Bryan, McIntosh, and Chatham Counties). The 26,154-acre property contains large marsh areas and tidal estuaries which are vital both as spawning and nursery grounds for fin and shell fish, and to the ecological health of Georgia's coast. Four endangered species—red-cockaded woodpecker, brown pelican, peregrine falcon, and southern bald eagle—frequent the area. Separated from Ossabaw Island by the Intracoastal Waterway, the land was given to the Conservancy via the American Land Trust by International Paper Company. The property is scheduled for transfer to the Georgia Department of Natural Resources.

Maine

SUCKER BROOK WATERSHED—Addition—(Oxford County). The Maine Chapter purchased 12 acres as an addition to Sucker Brook Watershed, which borders Kezar Lake. The area, composed of woodland and marsh, provides habitat for beaver, red fox, snowy owl, and a variety of waterfowl species. Now totaling 77 acres, the preserve is managed by the Maine Chapter and the Sucker Brook Watershed Committee.

Maryland

CRANESVILLE SWAMP — Addition — (Garrett County). The additional 20-acre tract provides a partial buffer for Cranesville Swamp, a National Natural Landmark lying just across the state line in Preston County, West Virginia. Studied by ecologists from all over the country, Cranesville is a unique ecosystem created by a high altitude, poor drainage, and cold moist air trapped in the swamp. Because of the environmental conditions, the preserve contains a relict colony of American larch. Managed by the West Virginia Chapter, the area now totals 313 acres.

SUGARLOAF MOUNTAIN—Addition—(Frederick County). A 64-acre tract at the base of Sugarloaf Mountain, a National Natural Landmark, was purchased by the Conservancy in cooperation with Stronghold, Inc. (a private, nonprofit organization which owns over 3,000 acres at Sugarloaf). A strategic inholding, the land contains stands of old-growth red oak and tulip poplar. The steep terrain affords excellent views

of the Monocacy and Potomac River valleys. Stronghold, Inc., will manage the area.

Michigan

BEAVER ISLAND (Charlevoix County). About 30 acres of the 40-acre tract are part of a large blueberry bog containing several species of mosses, including sphagnum. Yellow and white birch, mountain maple, and staghorn sumac are common on the higher ground. A gift of Eleanor Hoevet Perry and Lorraine Hoevet Johnson, the land will be transferred to the Michigan Department of Natural Resources for inclusion in Beaver Island Wildlife Research Area.

BI-CENTENNIAL WOODS (Lenawee County). In cooperation with Lenawee County, the Conservancy purchased 78 acres containing the last undisturbed stand of beech-maple forest in the county. The land, which is used by Adrian College for biology field trips and projects, will be managed by the county as a nature preserve.

New York

GREAT GULLY—Addition (Cayuga County). Lying along the east side of Cayuga Lake, the preserve is a four-mile scenic valley with a year-round stream containing two waterfalls. The entire gully is forested with mixed hardwoods, white pine, and hemlock. Rare plants include twinleaf, seneca snakeroot, and goldie fern. The purchase of another 55 acres brings the total acreage of the preserve to 107 acres. Great Gully is managed by the Conservancy's Central New York Chapter.

MANITOGA—Addition—(Putnam County). The 10-acre addition to the Conservancy's 69-acre

Manitoga Nature Center completes the preservation of a scenic overlook above the Hudson River. Besides a hemlock and hardwood forest, the property also contains a shallow gorge and a stream. The footpath through the tract is an important section of Manitoga's trail system, designed by the late Russel Wright. The Nature Center's staff will manage the newly purchased addition. A $75,000 fund-raising campaign is underway.

SILVER LAKE CAMP PRESERVE—Addition—(Clinton County). Betty Hicks, Hazel L. Kinzly, and Gladys Larsen Hicks—donors of the original 53-acre area—have given another 8 acres located adjacent to the preserve. The tract, which includes bluffs rising some 200 feet above Silver Lake, is dominated by a white pine and red pine forest, and supports serviceberry, blueberries, rare rusty woodsia (*Woodsia ilvensis*), and endangered pink lady's slipper. Pioneer hardwoods, some northern white cedar and white pine, and various grasses, sedges, and ferns dominate the steep slope. The addition is a dry site which increases the diversity of the preserve, already containing a bog, swamp, several successional stages of forest, and many rare and threatened plants. Management of the area will be the responsibility of the Adirondack Conservancy Committee, and the preserve will be used as a field study area by the State University of New York (SUNY) at Plattsburgh.

Ohio

LITTLE MIAMI RIVER (Hamilton County). A key area in the state's scenic river acquisition program, the property was donated by the Dravo Corporation of Pittsburgh, Pennsylvania. Managed by the State of Ohio's Department of Natural Resources and open to the public, the river-front floodplain forest consists of 42 acres in two parcels. The land lies on the east shore of the Little Miami River.

Pennsylvania

TANNERSVILLE BOG—Stuart M. Stein Memorial Preserve—(Monroe County). The 150-acre National Natural Landmark contains a northern sphagnum bog with a mature relict boreal bog forest dominated by black spruce and tamarack. The land includes 120 acres purchased by the Conservancy between 1957 and 1963 and then transferred to Lafayette College. The Conservancy's Northeast Pennsylvania Chapter is repurchasing the area from the college. Management of the preserve and fund-raising will be the responsibility of the Chapter.

Texas

ROY E. LARSEN SANDYLAND SANCTUARY (Hardin County). Time Inc., through its forest products subsidiary, Temple-Eastex, has donated 2,138 acres of arid sandylands in the Big Thicket area of East Texas. Regarded by naturalists as a rich biological laboratory, the tract will be managed by The Nature Conservancy. The gift was made under the auspices of the American Land Trust. Officials of Time, Temple-Eastex, the Conservancy, and the Trust were joined by Mrs. Lyndon B. Johnson in the dedication program. Members of the Big Thicket Association, which led the campaign for protection, were also present. The sanctuary has been named for Roy E. Larsen, the Vice Chairman of Time Inc., a member of the Conservancy's Board of Governors, and a life-long conservation advocate. The ecological importance of the land can be observed in the variety of plant systems within compact precincts. They include swamp, open-floor forest, and "desert" with cactus and Spanish-dagger yucca. The area contains 340 species of wildflowers.

SAN BERNARD NATIONAL WILDLIFE REFUGE (Brazoria and Matagorda Counties). Because the 2,495-acre property is located only an hour from Houston and lies between the Gulf and the Intracoastal Waterway, it was intensely threatened by resort development. Associated with the land is a series of large tidewater lakes known as Cedar Lakes. Together with the Cow Trap Lakes to the north, the Cedar Lakes provide fertile oyster grounds and a healthy nursery for shrimp, crabs, and finfish. The entire estuarine system is nourished by marsh runoff, Cedar Lake Creek, the San Bernard River, Gulf tides, and circulation through the waterway. Valued at almost $1.5 mil-

lion, the tract will be managed by the U.S. Fish and Wildlife Service in conjunction with the San Bernard National Wildlife Refuge.

SMITH MARSH (Matagorda County). Located north of the Intracoastal Waterway and adjacent to the San Bernard National Wildlife Refuge, the 2,375-acre area provides excellent year-round habitat for many species of birds. Of particular interest is the wintering concentration of waterfowl, especially geese. Predominant vegetation is smooth cordgrass, salt grass, shore grass, sedges, and rushes. An American Land Trust project, the marsh will eventually be transferred to the U.S. Fish and Wildlife Service for management, and will be included in the adjoining wildlife refuge.

Virginia

CHICKAHOMINY RIVER WILDLIFE MANAGEMENT AREA (Charles City County). Mixed upland hardwoods and pines as well as remnant bald cypress trees and swamp hardwood stands are part of the 581 acres purchased in cooperation with the Virginia Commission of Game and Inland Fisheries. Approximately 50 acres of the site are tidal marsh, with frontage on Parson's Creek, which constitutes a partial buffer for the Parsons Island-Old Neck Natural Area. Game and Inland Fisheries will manage the preserve.

Washington

LITTLE SPOKANE RIVER PARK CORRIDOR (Spokane County). Recognized as the most important natural area in the vicinity of Spokane, the 243-acre tract will be included in the new Little Spokane River Park Corridor. The park will eventually encompass 22 miles of the river's frontage, which contains near pristine riparian vegetation. Willow and cottonwood flourish by the river's edge, Ponderosa pine grows in the uplands on the north side of the Little Spokane River, and the south side contains a Douglas fir forest. Myriad songbirds, including many species of finch, nest on the preserve. Great Blue and green herons, bitterns, and threatened golden eagles nest in the vicinity. River otter, beaver, and mink enjoy the river's many varieties of fish. The first acquisition in the corridor, the land was purchased in a cooperative effort with the Spokane County Parks Department, which will manage the area.

West Virginia

SPRUCE KNOB-SENECA ROCKS NATIONAL RECREATION AREA (Pendleton County). In cooperation with the U.S. Forest Service, the Conservancy purchased a key inholding in Monongahela National Forest. The 235-acre tract includes rolling wooded hills, steep ridges, and an excellent view of Seneca Rocks.

The American Land Trust

A UNANIMOUS VOTE

By Lynn Mohn

All hands went up. The 93 members of the Long Beach Island Garden Club of New Jersey agreed—the $5,000 savings certificate, just matured, would be sent to the American Land Trust. The money, earned from pine seedling sales, holiday home tours, a Valentine card party, and other profit-making activities, would be earmarked for the Trust's New Jersey Pine Barrens project.

The $5,000 gift is the largest yet received from a single garden club.

To date, National Council of State Garden Clubs has tallied some $150,000 in contributions for the Trust's fifty fund-raising projects across the country. Mrs. William O. Douglas said recently, "National Council clubs' all-out effort for the Trust is the most dedicated commitment to land conservation that I've ever seen. . . . It's been most rewarding to participate with the clubs and see the outstanding work they've been doing." Mrs. Douglas, an attorney and a member of the Trust's National Committee, takes an active interest in the non-stop efforts of these 400,000 volunteers. She addressed National Council's annual convention in 1976, and has since spoken at state conventions in Maryland and Georgia and at a central regional meeting in Michigan.

There have been two more corporate gifts of significant natural land through the American Land Trust program. The Venus' fly trap, as well as four other rare and threatened plants, the black bear, alligator, and endangered puma all find refuge at Green Swamp in southeast North Carolina. A 13,850-acre donation—valued at over $4 million—was made by Federal Paper Board Company to the Conservancy. The North Carolina Natural Heritage Program had researched the area and recommended it as a high preservation priority. James B. Hunt, Jr., Governor of North Carolina, joined in announcing the Green Swamp acquisition at ceremonies in Raleigh.

A second gift, donated by the Brunswick Pulp Land Company, was the 63-acre LeConte-Woodmanston Plantation near Riceboro, Georgia. Home of the LeConte family from 1760 to 1843, the plantation once produced rice and cotton, but also contained an internationally celebrated botanical garden featuring *Camellia japonica*. The Brunswick gift comprises the heart of the original grounds. The land has been conveyed to the Garden Club of Georgia, which hopes to restore the garden.

Another purchase of land has been added to the list. Under Trust auspices, the Conservancy has exercised its option to buy 168 acres of remote and spectacular Washington state coastline, lying west of Seattle, valued at over $1 million. The property includes a mile-long beach wilderness and Point of the Arches, an offshore group of strangely shaped rocks, or seastacks. With eventual resale to the National Park Service, the land will be added to Olympic National Park.

Among fund-raising projects, Ashland Oil, Inc., has given $10,000 for Pilot Knob, Kentucky, and Alcoa Foundation has contributed $1,000 to Roan Mountain on the Tennessee/North Carolina border. Further financial support to the Trust has recently come from Union Carbide Corporation, Connecticut Mutual Life Insurance Company, Equitable Life Assurance Society, and Corning Glass Works.

The American Land Trust has also been instrumental in securing nine new corporate associates for The Nature Conservancy. These include: Remington Arms Company, Corning Glass Works, Field Enterprises Charitable Corporation, Lane Publishing Company, Missouri Pacific Railroad Company, Metromedia, Inc., Wheelabrator-Frye, Inc., CIBA-GEIGY Corporation, and Connecticut Mutual Life Insurance Company.

"Partnership That Pays Off for the Public"—that is what the July 1977 issue of *Nation's Business* called the American Land Trust's teamwork with business. The four-page article describes the Trust's successes in seeking and coordinating corporate land gifts to the Conservancy and tells how, through examples, "land holdings of marginal or less value can bring a return in tax breaks if properly donated . . . not to mention the benefit to the corporate image."

As of August 1, a dozen different companies, making fifteen separate contributions of land valued collectively at $30 million, have discovered that there is indeed a profit in giving it away . . . thanks to the American Land Trust.

Note: *Challenge to a Nation*, a 17-minute film on the American Land Trust, narrated by Hugh Downs, is available for free loan. Donors of $10 or more to the Trust become Honorary Trustees and receive certificates suitable for framing. If not already Conservancy members, donors are granted one-year memberships including *News* subscriptions. Donations honoring others are welcome. Contributions, inquiries, and film requests should be mailed to: American Land Trust, P.O. Box 2076, Arlington, VA 22202. Executive Director: George S. Wills. Phone: (703) 841-5376. Donations are tax-deductible. Please make checks payable to The Nature Conservancy.

VOLUNTEER NOTES

ENVIRONMENTAL EDUCATION PROGRAM BEGUN

The Conservancy's pilot environmental education program, called the "Student Stewardship Program," is an experimental project designed to involve schools and the local community in the stewardship of Conservancy preserves. The project was made possible by a grant from the Cleveland and Gund Foundations and was designed for the Conservancy by the Institute for Environmental Education. The program, being tested in northeast Ohio, is for gifted and talented students in the junior high through junior college level. Centered around an "Activity Calendar for Preserve Investigation," the program offers the teacher and the Conservancy's volunteer preserve stewardship committee a monthly set of activities from which to choose, depending on the teachers' interests, weather conditions, and the particular qualities of the preserve. Activity selections include map and compass skills, vegetation inventory techniques, set-up of photo monitoring sites, water investigations, soil analysis, a community questionnaire, bird counts, wildflower inventory, as well as a preserve field trip for neighbors at the end of the school year. In addition, the program is designed to continue in the school, with student participants in the program explaining their findings and techniques to students enrolled in the program the following year.

The program benefits the Conservancy, the schools, and the community in many ways. First, students involve the local residents in the preserve through the community questionnaire. This activity develops in the community a continuing sense of appreciation and responsibility for the preserve, thus aiding the stewardship committee with management responsibilities.

Second, students learn best when theories can be applied in the field. Activities of the program use techniques which teach students skills and knowledge directly related to research and problem-solving careers. In addition, students realize the monitoring data they collect is important and needed by the Conservancy's stewardship committees.

Third, the Conservancy's volunteer stewardship committees must protect a preserve from over-use. The monitoring data collected by students each year will provide the committee with annual information on the impact of use, thus aiding the committee in making management decisions.

Fourth, the program is designed so it can be implemented on a wide array of preserves and by other organizations, and will therefore help spread understanding about the importance of protecting natural areas.

And finally, Conservancy preserves are used as outdoor classrooms, thereby providing appropriate use of tax-exempt property.

The Conservancy is excited about the prospects of implementing the Student Stewardship Program nationally. Funds are being sought to evaluate the program in northeast Ohio during this school year with the intent of providing program materials to Conservancy volunteers in the fall of 1978. The Student Stewardship Program can play an integral part in our preserve stewardship efforts in future years by creating community awareness and responsibility for protection of our preserves; by generating student interest and membership in the Conservancy; and even by encouraging gifts of adjoining property to enlarge preserves.

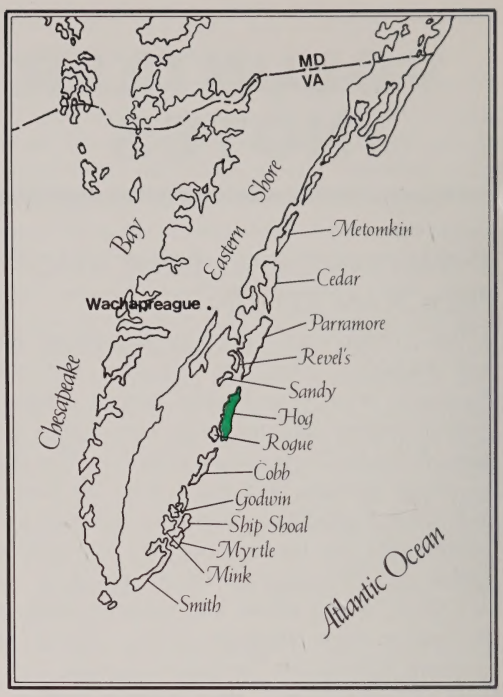
NEW CHAPTER AWARD ESTABLISHED

The Board of Governors has established an annual award to recognize chapters that make outstanding contributions toward the accomplishments of Conservancy objectives. The first award will be presented at the Annual Meeting in October to the Outstanding Chapter of 1976.

The award is presented to the chapter which uses its available resources most effectively to contribute to the Conservancy's overall program as stated in the national annual operating plan and long-range plan. In making the award, recognition will be given to accomplishments in such fields as establishment of preserves, membership development, scientific and educational programs, public awareness, publications, stewardship, and other efforts that advance the Conservancy's cause.

CHAPTER TAKES ON NEW TERRITORY

On May 21, 1977, the Board of Governors approved expansion of the Northeast Pennsylvania Chapter's territory to include the counties of Lycoming, Montour, Columbia, and Northumberland. The addition of these four counties will reinforce the Conservancy's presence in Pennsylvania and fill a void in private land conservation activities. Conservancy members living in the four counties are now members of the Northeast Pennsylvania Chapter.



Visit the Virginia Coast Reserve

Miles of sandy beaches. Acres of green marshes teeming with life. Flocks of sea and shore birds. The timeless rolling tides. Stretching from the Virginia-Maryland border south along the Delmarva Peninsula to the Chesapeake Bay, the Conservancy's Virginia Coast Reserve is one of the few segments of our coastline that looks much as it did 200 years ago. The 35,000-acre system contains Metomkin, Cedar, Parramore, Revel's, Sandy, Hog, Rogue, Cobb, Ship Shoal, Godwin, Myrtle, Mink, and Smith Islands. Biologists estimate that the marshlands linking the islands to the mainland are among the richest and most productive in the world. Ninety percent of the commercial fish and shellfish caught in the area are dependent on the marshes. Among the large concentrations of the islands' shorebirds, seabirds, and wintering waterfowl are loons, grebes, cormorants, snow geese, black ducks, egrets, herons, ibis, oyster-catchers, sandpipers, gulls, and terns. Ten species of hawks, three of which are rare or endangered, find refuge on the islands.

The Conservancy is offering its members the opportunity to visit one of these pristine islands—to see and enjoy one of the areas you have helped us save. As an experimental project, we are sponsoring a trip to Hog Island on the weekend of October 8 and 9, 1977. The cost of the trip is only $90 for Conservancy members. (Non-members must pay an additional $10 membership fee). The cost includes one night's lodging at the Wachapreague Inn, round-trip bus transportation, Saturday dinner, Sunday breakfast, and a box lunch on the island, as well as a $20 donation toward continued preservation of the barrier islands. Boat transportation to Hog Island on Sunday, as well as a nature guide, will be provided by the Conservancy. Participants will leave by bus from Washington, D.C., on Saturday afternoon, the 8th, and return the evening of the 9th. Arrangements for the outing are being handled by John Shields, a Washington-based travel consultant.

This is a very rare opportunity to see one of the most unspoiled ecosystems remaining in our country. For trip applications and additional details, please write to: Hog Island Project, P.O. Box 3611, Washington, D.C. 20007; or call John Shields at 202/296-1681. The reservation deadline is September 15, 1977. Please make your arrangements early, as we must limit the group to forty people.

PHOTO CREDITS: A. A. Allen/National Audubon Society, p. 20 top; Dave Armstrong, p. 24; Dr. Charles R. Belinky, p. 19; Susan Bournique, pp. 13 right, 30; Dennis Brack (Black Star), pp. 12 top right, 13 lower left; John Henry Dick, p. 20 right; Michael P. Gadomski, pp. 25-27; John Hall, pp. 4, 16 right; Ill. Nature Preserves Commission, p. 17; Charlotte Jones (N.C. Botanical Garden), p. 13 top left; Tom Kohlsaat, p. 14 bottom; Tim Loomis, p. 12 left; N.C. Dept. of Natural & Economic Resources, p. 12 lower right; Martha Price, p. 18 right; Robie Ray, pp. 10-11; K. Rogers, p. 18 left; Farley Smith, p. 7 top; S.C. Wildlife & Marine Resources Dept., pp. 6, 9, 14 top, 21.

NEW LIFE MEMBERS

An individual becomes a Life Member of The Nature Conservancy upon contribution of $500 for membership dues. The contribution is added to the Guarantee and Income Fund for the Conservancy's endowment.

Mrs. Laurence Bloedel
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